

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: GEORGE MALCOLM SWIFT JOYNES  
Serial No.: NOT YET ASSIGNED  
Filed: MARCH 20, 2001 Examiner: Unassigned  
Title: APPARATUS AND METHOD FOR REDUCING NOISE

PRELIMINARY AMENDMENT

Box Non-Fee Amendment  
Commissioner for Patents  
Washington, D.C. 20231

March 30, 2001

Sir:

Please enter the following amendments to the claims prior to the examination of the application.

IN THE SPECIFICATION:

Please amend the specification as follows: (The marked up version with markings to show changes made in the specification is attached.)

Replace the paragraph bridging pages 10 and 11, as follows:

In Figure 5, where parts also appearing in Figures 1-3 bear identical references, the circuit diagram 50 provides the basic noise cancellation function using a simple feedback loop arrangement. The sound measuring device 15, which may be a

microphone, is arranged to measure noise 55. The microphone is connected to a filter 65 via conductor 22. The filter is connected to an amplifier 52 via conductor 24. The amplifier is connected to an inverter 51 and then to a loudspeaker 16 via conductor 21. The filter functions to select which noise is passed on to the amplifier and the inverter and subsequently cancelled by the cancellation signal. The selection can be based on the spatial or spectral characteristics of the sound. For example, the filter may be a low pass filter allowing low frequency sound such as road noise to pass and subsequently be cancelled by the cancellation signal. High frequency sound such as voices in not passed by the filter and thus not cancelled by the cancellation signal. The inverter 51 functions to change the phase of the signal by 180 degrees which forms the cancellation signal. This cancellation signal is then transmitted by the loudspeaker as a sound wave towards area 80. The result is that in area 80 the noise measured by the microphone will be substantially reduced. As will be appreciated, the area 80 preferably corresponds to the location of one of the driver's or passenger's ears.

IN THE CLAIMS:

Please cancel Claims 25 and 64, without prejudice to or disclaimer of the subject matter thereof, and amend the remaining claims as follows:

(The marked up version with markings to show changes made in the claims is attached.)

3. (Amended) Apparatus as claimed in Claim 1, wherein said second location area is remote from said area.

4. (Amended) Apparatus as claimed in Claim 1, wherein said area is proximate to a human ear.

5. (Amended) Apparatus as claimed in Claim 1, wherein said transducer is human skin.

7. (Amended) Apparatus as claimed in Claim 5, wherein said transducer includes pressure sensitive paint.

8. (Amended) Apparatus as claimed in Claim 1, wherein said transducer is a sensor.

11. (Amended) Apparatus as claimed in Claim 1, wherein said measuring device is an optical device.

16. (Amended) Apparatus as claimed in Claim 1, wherein said apparatus further comprising a tracking device arranged to search for said transducer, to acquire a location of said transducer, and to track said location of said transducer, said tracking device being further arranged to communicate said location of said transducer to said measuring device.

18. (Amended) Apparatus as claimed in Claim 16, wherein said tracking device is a video tracking device.

19. (Amended) Apparatus as claimed in Claim 1, wherein said apparatus further comprising a further measuring device disposed remote from said area and arranged to measure background noise proximate to said area, said background noise being communicated to said sound cancellation device to facilitate reducing the amount of noise audible in said area.

21. (Amended) Apparatus as claimed in Claim 1, wherein said apparatus further comprising a filter disposed between said measuring device and said cancellation device and arranged to

pass a range of frequencies, thereby enabling said apparatus to cancel noise based on a frequency of said noise.

22. (Amended) Apparatus as claimed in Claim 1, wherein said area is in a vehicle.

28. (Amended) Apparatus as claimed in Claim 26, wherein said transducer includes pressure sensitive paint.

30. (Amended) Apparatus as claimed in Claim 26, wherein said transducer is human skin.

31. (Amended) Apparatus according to Claim 29, wherein the skin forms part of the ear of the observer.

33. (Amended) Apparatus as claimed in Claim 27, wherein said optical device is an interferometer.

38. (Amended) Apparatus according to Claim 35, wherein the transducer comprises a sensor embedded in an item of jewelry for wearing on the ear of the observer.

39. (Amended) An item of jewelry, for wearing on or proximate the ear, comprising a transducer for use in a system according to Claim 26.

40. (Amended) Apparatus, or an item of jewelry according to claim 38, wherein the item of jewelry is in the form of an earring.

41. (Amended) Apparatus as claimed in claim 26, wherein said apparatus further comprises a filter disposed between said measuring device and said cancellation device and arranged to pass a range of frequencies, thereby enabling said apparatus to cancel noise sound based on a frequency of said noise.

42. (Amended) Apparatus as claimed in claim 26, wherein said apparatus further comprising a tracking device arranged to search for said transducer, to acquire a location of said transducer, and to track said location of said transducer, said tracking device being further arranged to communicate said location of said transducer to said measuring device.

44. (Amended) Apparatus as claimed in claim 42, wherein said tracking device is a video tracking device.

45. (Amended) Apparatus as claimed in claim 25, wherein said apparatus further comprises a further measuring device disposed remote from said area and arranged to measure background noise proximate to said area, said background noise being communicated to said sound cancellation device to facilitate reducing the amount of noise audible in said area.

49. (Amended) A method as claimed in Claim 47, wherein said reflection comprises reflection from pressure sensitive paint.

51. (Amended) A method as claimed in Claim 47, wherein human skin is used as the transducer.

52. (Amended) A method according to Claim 50 wherein the skin of the ear of the observer is used as the transducer.

54. (Amended) A method as claimed in Claim 47, wherein the light is measured in an interferometer.

59. (Amended) A method according to Claim 56, wherein the transducer is embedded in an item of jewelry for wearing on the ear of the observer.

60. (Amended) A method as claimed in Claim 47, further comprising filtering between a measuring device and said cancellation device to pass a range of frequencies, thereby enabling said apparatus to cancel noise sound based on a frequency of said noise.

61. (Amended) Apparatus as claimed in claim 47, further comprising tracking by searching for said transducer, acquiring a location of said transducer, tracking said location of said transducer, and communicating said location of said transducer to said measuring device.

63. (Amended) A method as claimed in Claim 47, comprising the further step of measuring background sound remote to said area, and using said measurement of background sound to facilitate the reducing the amount of noise audible in said area.

(Applicant's Remarks are set forth hereinbelow, starting on the following page.)



REMARKS

Entry of the amendments to the claims before examination of the application is respectfully requested. These claims have been amended to remove multiple dependencies.

If there are any questions regarding this Preliminary Amendment or this application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response and shortages in other fees, be charged, or any overpayment in fees be credited, to the Account of Evenson, McKeown, Edwards & Lenahan, P.L.L.C., Deposit Account No. 05-1323 (Docket #3036/49818).

Respectfully submitted,

  
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE  
SPECIFICATION**

In Figure 5, where parts also appearing in Figures 1-3 bear identical references, the circuit diagram 50 provides the basic noise cancellation function using a simple feedback loop arrangement. The sound measuring device 15, which may be a microphone, is arranged to measure noise 55. The microphone is connected to a filter 65 via conductor 22. The filter is connected to an amplifier 52 via conductor [24] 53. The amplifier is connected to an inverter 51 and then to a loudspeaker 16 via conductor 21. The filter functions to select which noise is passed on to the amplifier and the inverter and subsequently cancelled by the cancellation signal. The selection can be based on the spatial or spectral characteristics of the sound. For example, the filter may be a low pass filter allowing low frequency sound such as road noise to pass and subsequently be cancelled by the cancellation signal. High frequency sound such as voices in not passed by the filter and thus not cancelled by the cancellation signal. The inverter 51 functions to change the phase of the signal by 180 degrees which forms the cancellation signal. This cancellation signal is then transmitted by the loudspeaker as a sound wave towards area 80. The result is that in area 80 the noise measured by the microphone will be substantially reduced. As will be appreciated, the area 80

preferably corresponds to the location of one of the driver's or passenger's ears.

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

3. (Amended) Apparatus as claimed in [any preceding Claim,] Claim 1, wherein said second location area is remote from said area.

4. (Amended) Apparatus as claimed in [any preceding Claim,] Claim 1, wherein said area is proximate to a human ear.

5. (Amended) Apparatus as claimed in [any preceding Claim,] Claim 1, wherein said transducer is human skin.

7. (Amended) Apparatus as claimed in [any of Claims 5-6,] Claim 5, wherein said transducer includes pressure sensitive paint.

8. (Amended) Apparatus as claimed in [any of Claims 1-4,] Claim 1, wherein said transducer is a sensor.

11. (Amended) Apparatus as claimed in [any of Claims 1-8,] Claim 1, wherein said measuring device is an optical device.

16. (Amended) Apparatus as claimed in [any preceding claims,] Claim 1, wherein said apparatus further comprising a tracking device arranged to search for said transducer, to acquire a location of said transducer, and to track said location of said transducer, said tracking device being further arranged to communicate said location of said transducer to said measuring device.

18. (Amended) Apparatus as claimed in [any of Claims 16-17,] Claim 16, wherein said tracking device is a video tracking device.

19. (Amended) Apparatus as claimed in [any preceding claim,] Claim 1, wherein said apparatus further comprising a further measuring device disposed remote from said area and arranged to measure background noise proximate to said area, said background noise being communicated to said sound cancellation device to facilitate reducing the amount of noise audible in said area.

21. (Amended) Apparatus as claimed in [any preceding claim,] Claim 1, wherein said apparatus further comprising a filter disposed between said measuring device and said cancellation device and arranged to pass a range of frequencies,

thereby enabling said apparatus to cancel noise based on a frequency of said noise.

22. (Amended) Apparatus as claimed in [any preceding claim,] Claim 1, wherein said area is in a vehicle.

28. (Amended) Apparatus as claimed in [any of Claims 26-27,] Claim 26, wherein said transducer includes pressure sensitive paint.

30. (Amended) Apparatus as claimed in [any of Claims 26-27,] Claim 26, wherein said transducer is human skin.

31. (Amended) Apparatus according to [Claim 29 or Claim 30] Claim 29, wherein the skin forms part of the ear of the observer.

33. (Amended) Apparatus as claimed in [any of Claims 27-32,] Claim 27, wherein said optical device is an interferometer.

38. (Amended) Apparatus according to [any of Claims 35-36] Claim 35, wherein the transducer comprises a sensor embedded in an item of [jewellery] jewelry for wearing on the ear of the observer.

39. (Amended) An item of [jewellery] jewelry, for wearing on or proximate the ear, comprising a transducer for use in a system according to [any of Claims 26-28] Claim 26.

40. (Amended) Apparatus, or an item of [jewellery] jewelry according to claim 38 [or claim 39], wherein the item of [jewellery] jewelry is in the form of an earring.

41. (Amended) Apparatus as claimed in [any of claims 26-38, or 40] claim 26, wherein said apparatus further comprises a filter disposed between said measuring device and said cancellation device and arranged to pass a range of frequencies, thereby enabling said apparatus to cancel noise sound based on a frequency of said noise.

42. (Amended) Apparatus as claimed in [any of claims 26-38, 40 or 41] claim 26, wherein said apparatus further comprising a tracking device arranged to search for said transducer, to acquire a location of said transducer, and to track said location of said transducer, said tracking device being further arranged to communicate said location of said transducer to said measuring device.

44. (Amended) Apparatus as claimed in [any of Claims 42-43,] claim 42, wherein said tracking device is a video tracking device.

45. (Amended) Apparatus as claimed in [any of claims 25-38, 40-44,] claim 25, wherein said apparatus further comprises a further measuring device disposed remote from said area and arranged to measure background noise proximate to said area, said background noise being communicated to said sound cancellation device to facilitate reducing the amount of noise audible in said area.

49. (Amended) A method as claimed in [any of Claims 47-48,] Claim 47, wherein said reflection comprises reflection from pressure sensitive paint.

51. (Amended) A method as claimed in [any of Claims 47-48,] Claim 47, wherein human skin is used as the transducer.

52. (Amended) A method according to Claim 50 [or Claim 51] wherein the skin of the ear of the observer is used as the transducer.

54. (Amended) A method as claimed in [any of Claims 47-53,] Claim 47, wherein the light is measured in an interferometer.

59. (Amended) A method according to [any of Claims 56-58] Claim 56, wherein the transducer is embedded in an item of [jewellery] jewelry for wearing on the ear of the observer.

60. (Amended) A method as claimed in [any of Claims 47-59,] Claim 47, further comprising filtering between a measuring device and said cancellation device to pass a range of frequencies, thereby enabling said apparatus to cancel noise sound based on a frequency of said noise.

61. (Amended) Apparatus as claimed in [any of claims 47-60,] claim 47, further comprising tracking by searching for said transducer, acquiring a location of said transducer, tracking said location of said transducer, and communicating said location of said transducer to said measuring device.

63. (Amended) A method as claimed in [Claims 47-62,] Claim 47, comprising the further step of measuring background sound remote to said area, and using said measurement of background sound to facilitate the reducing the amount of noise audible in said area.